

CLAIMS

1. Method for the laser ablation of a radioactive surface (218) located in a cleaning area (206), this ablation using a laser beam (216) emitted by a cavity (204) associated with pumping means (202) supplying electromagnetic radiation to the cavity (204), characterized in that the cavity (204) is associated with the pumping means (202) through an optical fiber (210) that transmits the electromagnetic radiation such that these pumping means (202) are kept outside the cleaning area (206), the pump radiation having a wavelength weakly attenuated in the fiber whose length is more than 10 meters.

2. Method according to claim 1 characterized in that the cleaning is applied to a toxic element, for example a radioactive element, in such a way that the cleaning area (206) is considered to be a contaminated area.

3. Method according to claim 1 or 2 characterized in that the ablation laser beam (216) is emitted in a pulsed manner.

4. Method according to claim 1, 2, 3 or 4, characterized in that the electromagnetic pump radiation is given continuously by the optical fiber (210).

5. Method according to one of the preceding claims, a plurality of fibers being used to transmit the pump energy, characterized in that this pump energy is diffused transversally relative to the axis of the laser medium situated in the cavity.

6. Method according to one of the preceding claims, characterized in that the pump energy is transmitted by fibered diodes.

7. Method according to one of the preceding claims characterized in that the wavelength of the laser beam generated by the cavity is modified by means of at least one non-linear crystal (224) so that this wavelength is included in the UV domain.

8. Method according to claim 9 characterized in that the modified wavelength is smaller than 400 nm.

9. Method according to one of the claims 9 or 10 characterized in that a layer of liquid is deposited or droplets are deposited on the sublimated surface.

10. Method according to one of the preceding claims, characterized in that the mean power delivered by the laser is greater than 200 w.

11. Device for the laser ablation of a surface situated in a cleaning area, this ablation using a laser beam emitted by a cavity associated with pumping means giving electromagnetic radiation to the cavity, characterized in that it comprises an optical fiber transmitting the electromagnetic radiation of the pumping means to the cavity according to one of the methods in accordance with one of the preceding claims.

12. Robotic system for the laser ablation of a surface comprising a device according to claim 8, characterized in that it comprises a hinged armed capable of carrying out a scan of the surface to be cleaned.

13. Robotic system according to claim 13, characterized in that the surface to be cleaned is in a highly radioactive environment, and in that the hinged arm is a robot capable of working in the presence of ambient nuclear radiation.